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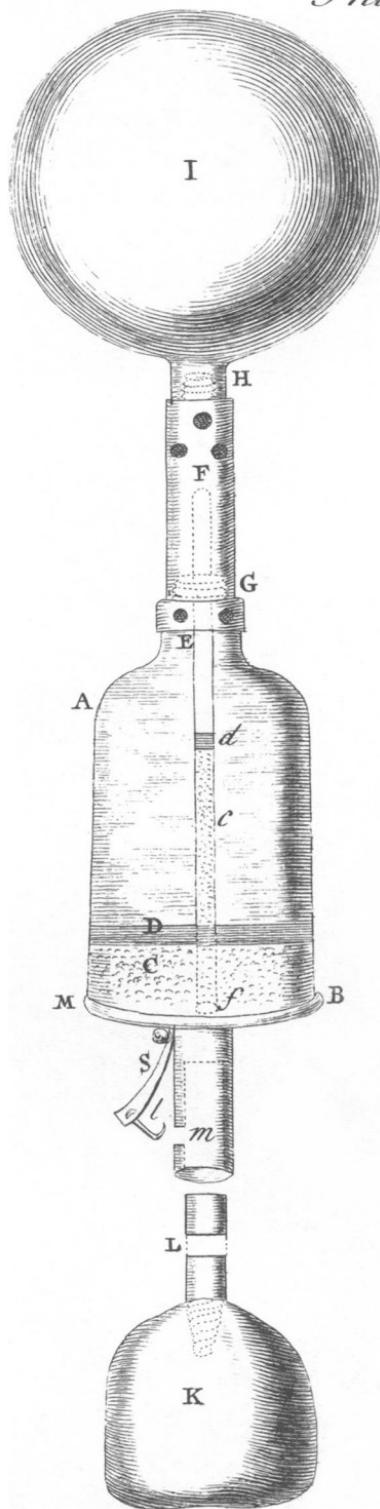
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Phases Micrometro dimensæ.

Dig.						H.	'	"
1	-	-	-	-	-	5	22	30
2	-	-	-	-	-	30	50	
3	-	-	-	-	-	37	54	
4	-	-	-	-	-	44	30	
4 33'	-	-	-	-	-	47	30	

Solis Semidiameter sæpius micrometro dimensa exacte implebat 16' 0".

In disco Solari maculæ à quatuor notatis in immersione, diversæ plures apparuere ; Sed eæ exiliores, quām ut immersio illarum quoque per vapores Phœbum obscurantes discerni posset.

VI. An Account of a Machine for measuring any Depth in the Sea, with great Expedition and certainty ; shewn to the Royal Society, by J. T. Desaguliers, L. L. D. and R. S. S. contriv'd by the Rev. Mr. Stephen Hales, F. R. S. and Himself.

THERE have been several Machines contriv'd for measuring the different Depths of the Sea, especially such as could not be determined by the Lead and Line ; but as those Machines consisted of two Bodies (the one specifically lighter, and the other specifically heavier than Water) so joined together, that as soon as the heavy one came to the Bottom, the lighter should get loose from it, and emerge ; and the Depth was to be estimated by the Time of the Fall of the compound Body

Body from the Top to the Bottom of the Water, together with the Time of the Emerson of the lighter Body, reckoned from the disappearing of the Machine, till the emergent Body was seen again, no certain Consequence could be drawn from so precarious and complex an Experiment.

For even in still Water, and in the same Place, the Time will hardly be the same in two Experiments : Much less will this Machine answer in the Sea, on Account of Waves and Currents, and many other Hindrances.

But as the Pressure of Fluids in all Directions is always the same at the same Depth, a Gage which exactly discovers what the Pressure is at the Bottom of the Sea, will shew what is the true Depth of the Sea in that Place, whether the Time of the Descent of the Machine be but a Minute or two, or twenty Times as long.

The Reverend Mr. *Hales*, in his *Vegetable Staticks*, describes his Gage for estimating the Pressures made in opake Vessels ; where Honey being poured over the Surface of Mercury in an open Vessel, rises upon the Surface of the Mercury as it is pressed up into a Tube whose lower Orifice is immersed into the Honey and Mercury, and whose Top is hermetically sealed. Now as, by the Pressure, the Air in the Tube is condensed, and the Mercury rises, so the Mercury comes down again when the Pressure is taken off, and would leave no Mark of the Height to which it had risen ; but the Honey (or Treacle, which does better) which is upon the Mercury, sticking to the Inside of the Tube, leaves a Mark, which shews the Height to which the Mercury had risen, and consequently makes appear what was the greatest Pressure.

My

My Contrivance therefore is a Machine which will carry down Mr. *Hales's* Gage to the Bottom of the Sea, and immediately bring it up again. *See the Figure.*

A B, is the Gage Bottle.

F f, the Gage Tube cemented to the Brass Cap of the Bottle at G, with its open End f immers'd in the Mercury C, which by the Pressure of 32 Foot of Water is carried up to d with a little Treacle or Honey d upon it, rais'd up from D, a small Thickness of Treacle pour'd on upon the Mercury.

When the Pressure of Water is from a Depth of 64 Foot, the Mercury and Treacle rise up to E, $\frac{2}{3}$ of the Height of the Tube; and so higher proportionably to the Depth.

N. B. *A Scale may be mark'd on the Tube with a Diamond.*

K, is a Weight hanging by its Shank L in a Socket m, fix'd to the Ring MB cemented at the Bottom of the Bottle. When the Hole L of the Shank is shov'd up to m, the Catch l of the Spring S holds it from falling out of the Socket, whilst the Machine is descending. But as soon as K touches the Ground at the Bottom of the Sea, the Hole L rising, the Catch flies back and lets go the Weight, as it is seen in the Figure. Then the empty Glass Ball I (which at Sea may be a Hog's Bladder) rises up to the Surface of the Water with the Machine, in which observing how high the Inside of the Tube is daub'd, the Pressure, and consequently the Depth of the Sea is known.

H G, is a Brass Tube to guard the Top of the Gage Tube.

There are Holes at F, G and E, to admit the Water to pass freely every where.

F f f f

To

To confirm the Use of this Sea-Gage, shewn before to the Society, I made another Experiment in the following Manner. Having pour'd some Quick-silver into the Bottle of the Gage, I pour'd on upon it Treacle to the Depth of half an Inch, then screw'd on the Brads Cap of the Bottle to which the Glass Gage-Tube was cemented ; by which Means the open End of the Tube was brought under the Surface of the Mercury, the sealed End being upwards. The Machine, thus fitted, was immers'd in a cylindrick Vessel of Water, which with a Plate at Top was press'd between two Pillars, in such Manner that Air might be condens'd over the Water without escaping. Then having forc'd in so much Air with a Syringe, as to lay on a Pressure equal to what would be in a Depth of 40 Foot of Water, I open'd the Cock of the upper Plate, let out the Air, and, upon taking out the Machine, it appear'd how high the Quick-silver had risen in the Gage-Tube, by the greasy Mark which the Treacle left within.

VII. *Extract of Two uncommon Cases of Tumours of the Abdomen, from a Latin Tract publish'd at Strasburgh, Anno 1728, and entituled, Joannis Boecleri, M. D. &c. ad Exteros Medicos Epistola ; by W. Rutty, M. D. R. S. Secr.*

TH E first is concerning a Woman, an Inhabitant of *Strasburgh*, of Thirty-two Years of Age, whose Belly, after an immature and hasty Labour, grew gradually for Ten Years together. During the whole